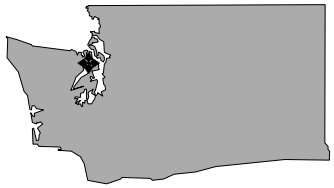
Whidbey Island Naval Air Station — Ault Field and Seaplane Base — NPL

Size: 7,000 acres
Mission: Serve as training and operations center for the A-6 and A-6E bomber squadrons; serve as center for U.S. Navy and Marine Corps reserve training in the Pacific Northwest
HRS Score: 39.64 (Seaplane Base); placed on NPL in February 1990
48.48 (Ault Field); placed on NPL in February 1990
IAG Status: Federal Facility Agreement signed in September 1990
Contaminants: Chlorinated solvents, PCBs, and PAHs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $67.6 million
Estimated Cost to Completion (Completion Year): $105.1 million (FY2029)
Final Remedy in Place or Response Complete Date: FY2013



Oak Harbor, Washington

Restoration Background

Whidbey Island Naval Air Station occupies four separate areas on Whidbey Island: Ault Field, the Seaplane Base, the Outlying Field, and the Lake Hancock Target Range. The Seaplane Base and Ault Field were placed on the National Priorities List (NPL) in February 1990. Past disposal practices resulted in contamination at several sites, including six former landfills. Other operations that contributed to contamination are aircraft maintenance, vehicle maintenance, public works shop activities, and firefighting training activities.

Environmental investigations, which began in FY84, have identified 52 sites at the installation. These 52 sites have been grouped into 5 operable units (OU). Of the 52, 18 were recommended for no further action. No sites were identified at the Outlying Field. The installation also has 36 underground storage tank (UST) sites.

In FY90, the Navy signed a Federal Facility Agreement (FFA) for Ault Field and the Seaplane Base. The FFA specified that 26 sites were to undergo more-intensive sampling programs under a Hazardous Waste Evaluation Study (HWES) for potential inclusion in a Remedial Investigation and Feasibility Study (RI/FS). After the HWES was completed in FY94, two sites were recommended for an RI/FS because of soil and groundwater contamination. Removal Actions were recommended for seven sites.

From FY91 to FY95, early actions, including UST Removal Actions, removal of contaminated soil, and Interim Remedial Actions, were conducted at the installation. The installation also conducted corrective actions at 16 UST sites in FY94.

During FY95, the installation completed RI/FS activities at one OU. A Record of Decision (ROD) was signed and a Remedial Design (RD) completed for another OU. Remedial Actions (RA) were completed at two OUs, and various USTs were removed from the installation. Groundwater contamination from a former Navy landfill was found to be migrating off base and threatening the water supplies of private landowners. A pump-and-treat system began full-scale operation to control the migration of contamination. In addition, the private wells have been closed, and the residences have been connected to public water supplies.

An RA that removed sediment by dredging 7,000 linear feet of runway ditches was completed. The sediment is contaminated with petroleum hydrocarbons, inorganic compounds, and polyaromatic hydrocarbons.

In FY95, the Seaplane Base was deleted from the NPL and from the state of Washington's Hazardous Sites List. Soil excavation activities have sufficiently reduced the threat to human health and the environment.

The installation converted its technical review committee to a restoration advisory board (RAB) in FY94. The Navy prepared a Readers Guide for the RAB and the community. The guide provides a technical summary of RI/FS activities at a specific OU. The installation completed a community relations plan (CRP) in FY91 and updated the CRP and solicited comments from the community at an open house in FY95.

During FY96, the RAB met monthly. The installation updated the CRP and completed the RA to remove contaminated sediment from the runway ditches. Work continued on the landfill cap while the pump-and-treat system at the landfill was upgraded. Other activities that occurred in FY96 are the signing of a ROD, the beginning of RD at OU5, continuation of long-term monitoring (LTM) at OU2, and the closing-in-place of a UST.

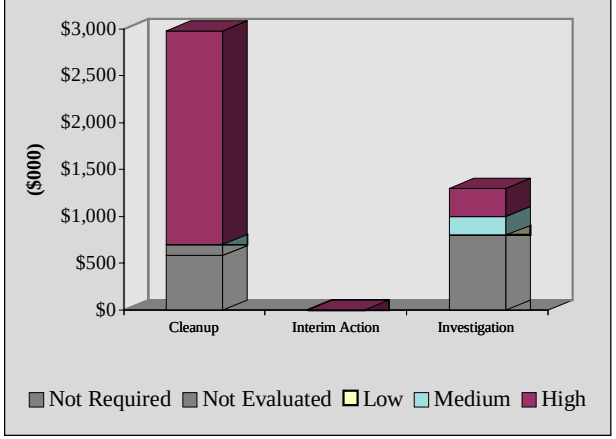
FY97 Restoration Progress

The installation completed the RD and the RA for three sites at OU5. The landfill cap was also completed. RODs for three sites were signed, and RDs for two sites were completed. The process of deleting OU3 (Ault Field) from the NPL began in FY97 with the completion of the Construction Complete milestone. In addition, LTM and operation and maintenance (O&M) continued at OU1, and LTM continued at OU2.

Plan of Action

- Continue LTM and O&M at OU1 in FY98
- Continue LTM at OU2 and OU5 in FY98
- Close monitoring wells at OU3 in FY98

FY98 Funding by Phase and Relative Risk



Size: 710 acres
Mission: Research, develop, test, and evaluate ordnance technology
HRS Score: NA
IAG Status: None
Contaminants: Explosive compounds, waste oil, PCBs, heavy metals, VOCs, and SVOCs
Media Affected: Groundwater, surface water, sediments, and soil
Funding to Date: $7.2 million
Estimated Cost to Completion (Completion Year): $30.1 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003

Silver Spring, Maryland

Restoration Background

In July 1995, closure of White Oak Naval Surface Warfare Center was recommended by the BRAC Commission. The functions performed at White Oak are to be absorbed by Panama City Coastal Systems Station and Carderock's Indian Head and Dahlgren Divisions. The facility closed permanently in July 1997. The General Services Administration (GSA) and the Local Redevelopment Authority are developing a land reuse plan.

Historical activities at the installation include landfill disposal of oils, polychlorinated biphenyls (PCB), solvents, paint residue, and miscellaneous chemicals (including mercury); disposal of chemical research wastewater in dry wells; burning of explosive ordnance; and composting of sludge. Records also indicate that a radium spill occurred at the installation. The primary contaminants of concern are volatile organic compounds (VOC), PCBs, cadmium, chromium, lead, mercury, nickel, and ordnance compounds, such as RDX and TNT. Contaminants are primarily affecting groundwater and surface water.

Environmental studies have identified 14 sites at the installation. Seven sites required no further action after the Preliminary Assessment phase in FY84. Activities for the remaining sites proceeded to the Site Inspection (SI) phase, which was completed in FY87. Contamination was detected at all seven of the sites included in the SI, and further investigation was recommended. PCBs detected in surface soil at the Apple Orchard Landfill site represented a risk to people who had access to the site; therefore, a fence was installed to restrict access.

The installation completed the Remedial Investigation and Feasibility Study (RI/FS) phase for all seven remaining sites in FY93. The Human Health Risk Assessment identified a present risk at the Apple Orchard Landfill site and a potential risk at the remaining six sites. On the basis of the risk assessment, source removal was recommended for five sites and encapsulation for two sites. A public comment period on the proposed remediation technologies followed a public meeting held in FY94. The installation began Remedial Design (RD) for six of the sites in FY94.

Meanwhile, a RCRA Facility Assessment, conducted in FY89, identified 97 solid waste management units (SWMU) and 19 areas of concern (AOC), including the 14 sites identified during the Preliminary Assessment. Thirty-eight of the SWMUs required further investigation.

A technical review committee (TRC) was formed in FY89. In FY94, the installation established an administrative record, which is maintained at the Engineering Field Activity Chesapeake. The installation also established an information repository for the public at the White Oak Library in White Oak, Maryland. A community relations plan was published in FY94.

During FY96, the installation converted its TRC to a restoration advisory board (RAB), which meets monthly. The installation also formed a BRAC cleanup team (BCT); completed RDs for Sites 8, 9, and 11; initiated Remedial Actions (RA); completed an Environmental Baseline Survey (EBS); and began to develop a BRAC Cleanup Plan. The RDs for Sites 2, 3, and 4 also continued during FY96.

FY97 Restoration Progress

A Finding of Suitability to Transfer to GSA and the Army was conducted at the installation. Interim Remedial Actions (IRA) for Sites 8, 9, and 11, and several underground storage tank removals, were completed, and the RI/FS for Sites 7 and 9 was initiated. Relative Risk Site Evaluations have been completed at 29 sites.

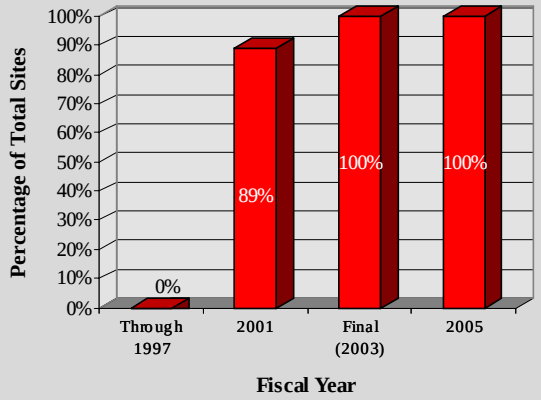
To improve site management, the installation is using a partnering approach with the BCT. An increase in conference calls by the BCT and better communication have helped expedite document review and resolve issues with regulatory agencies. The BCT approved a Removal Action for the Army site and work plans at AOC 1, a basewide background study, and the SI for Site 46. The RAB provided input on all FY97 actions.

The land reuse plan that was scheduled for development in FY97 as a prerequisite for leasing property to GSA and the Army was not completed because it was not required for a federal-to-federal transfer.

Plan of Action

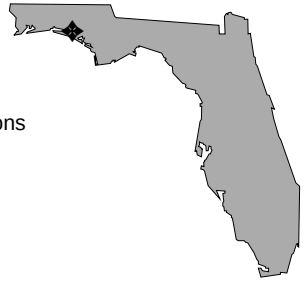
- Initiate RI/FS at 18 sites in FY98
- Initiate RA at two sites in FY98
- Initiate IRAs at three sites in FY98
- Initiate RDs at four sites in FY98
- Perform RI/FS activities at Sites 5 and 6 in FY00
- Begin RAs for six sites in FY02
- Begin RD for the remaining site in FY02, with RA beginning in FY03

Sites Achieving RIP or RC Per Fiscal Year



Whiting Field Naval Air Station NPL

Size: 2,560 acres
Mission: Train student naval aviators
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Pesticides, PCBs, VOCs, heavy metals, and chlorinated hydrocarbons
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $19.0 million
Estimated Cost to Completion (Completion Year): $56.3 million (FY2015)
Final Remedy in Place or Response Complete Date: FY2013



Milton, Florida

Restoration Background

In FY85, a Preliminary Assessment (PA) identified 23 sites at Naval Air Station (NAS) Whiting Field. In FY89, a supplemental PA identified five sites at the Outlying Landing Field (OLF) Barin. Site types include disposal areas and pits, storage areas, spill areas, landfills, a disposal and burning area, a maintenance area, underground storage tanks (UST) and fuel pits, fire training areas, and drainage ditches. There are currently 39 CERCLA sites.

In FY87, Site 5 was determined to require no further action (NFA). In FY89, Remedial Investigation and Feasibility Study (RI/FS) activities began for most sites at the installation. In FY92, soil contaminated with mercury, lead, and methylene chloride was detected at the OLF Barin. RI/FS activities were initiated for the five original sites and for five new sites at OLF Barin and for six sites at NAS Whiting Field.

In FY94, the installation completed a Baseline Risk Assessment for the OLF Barin and a Baseline Risk Assessment work plan for the NAS. In FY95 and FY96, the installation completed the RI/FS activities and closed four sites at OLF, with NFA necessary.

During an assessment of six UST sites, contamination with chlorinated hydrocarbons was detected, and 19 tanks were identified. In FY92, Removal Actions were completed for all USTs and associated soil. In FY94, two UST sites were closed. In FY95, a corrective action plan (CAP) was completed for one UST site, and corrective measures were initiated for three sites. A decision for NFA at three UST sites has been approved, and three UST sites remain.

The NAS formed a technical review committee (TRC) in FY89. A community relations plan (CRP) was completed in FY91 and updated in FY95. NAS formed a TRC for OLF Barin in FY92. A CRP was completed for the OLF Barin in FY93. In FY95, both TRCs were converted to restoration advisory boards (RAB).

Also during FY95, NAS initiated a partnership agreement with regulators and stakeholders.

FY97 Restoration Progress

Five sites were completed and closed at OLF Barin. Two of the sites required NFA. Two sites required Interim Removal Actions, then NFA. One site required a Removal Action. At the NAS, groundwater was broken out as a separate site. This decision enabled the installation to finish investigations at 17 sites. After completion of a Baseline Risk Assessment for Sites 1, 2, 6, 9 through 16, and 29, and an NFA letter proposal for Sites 36 and 37, these sites are expected to require NFA. After an Interim Remedial Action (IRA), Site 17 is expected to require NFA.

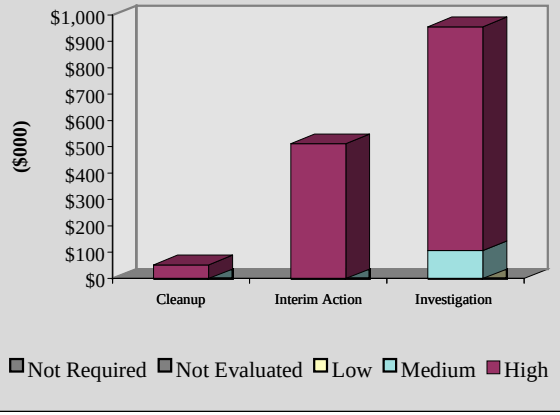
During FY97, a large UST site was investigated and a significant amount of petroleum-impacted soil was found. Changes in state regulations and the low risk of migration of contamination from the site may allow the site to be approved for a monitoring-only designation. Existing funds were used to investigate Clear Creek and off-base migration. The NAS completed a CAP and began a Remedial Design (RD) for one UST site. NAS has placed a contractor on the board review to ensure that all permits are in place. Partnering efforts made the Clear Creek investigation a success.

Lack of funding delayed implementation of some actions planned for FY97. In two cases, RD was delayed, pending collection of data on natural attenuation. Reports scheduled for FY97 were delayed so that the installation's cleanup team could collect more information.

Plan of Action

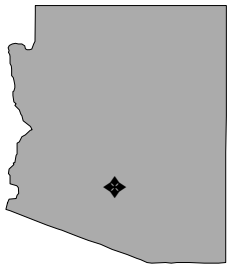
- Conduct field investigations at NAS for Sites 3, 4, 30, 32, and 33 in FY98
- Complete IRA at NAS for Site 17 in FY98
- Complete NFA letters for Sites 36 and 37 at NAS in FY98
- Add a new site for the Machine Gun Butt Area NAS in FY98
- Prepare Remedial Action Plan for one site at NAS in FY98
- Continue long-term operations and maintenance for UST site at NAS in FY98
- Finish RI/FS for Site 22 at OLF Barin in FY98
- Complete Installation Restoration Program at OLF Barin in FY98
- Finish RI/FS Report at NAS for Sites 3, 4, 30, 32, and 33 in FY99
- Complete RI/FS with a NFA designation for NAS Sites 1, 2, 6, 9 through 17, and 29 in FY99
- Complete groundwater investigation at NAS in FY99
- Sign Federal Facility Agreement for NAS in FY99

FY98 Funding by Phase and Relative Risk



Williams Air Force Base

Size: 4,042 acres
Mission: Supported pilot training and ground equipment maintenance
HRS Score: 37.93; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in 1990
Contaminants: VOCs, petroleum/oil/lubricants, heavy metals, and pesticides
Media Affected: Groundwater and soil
Funding to Date: $41.2 million
Estimated Cost to Completion (Completion Year): $1.6 million (FY2027)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Chandler, Arizona

Restoration Background

In July 1991, the BRAC Commission recommended closure of this installation. Williams Air Force Base (AFB) closed on September 30, 1993.

Before base closure, environmental studies identified 15 sites at the installation. These sites were consolidated into three operable units (OU). In FY93, an Environmental Assessment of 30 additional areas resulted in creation of two more OUs, including 17 new Installation Restoration Program (IRP) sites. OU1 contains 10 sites; OU2 is the liquid fuels storage area; OU3 consists of Fire Training Area No. 2 and a collapsed stormwater line; OU4 contains 9 sites; and OU5 contains 9 sites. A sixth OU was created by Consensus Statement at the April 1997 Technical Working Group Meeting at Williams AFB (Site SS-17 was moved from OU4 to maintain the OU4 schedule). OU6 is the Old Pesticide/Paint Shop.

Removal Actions and Interim Remedial Actions included removal of buried containers, contaminated soil, and 12 underground storage tanks (UST). In FY94, all known USTs and oil-water separators were removed. A free-product extraction system was installed at IRP Site ST-12 (OU2) in FY90 and operated through 1996. At ST-12, approximately 10,000 gallons of free product of the estimated 500,000 to 1 million gallons of fuel spilled have been removed.

In FY93, a Record of Decision (ROD) was signed for OU2, and the installation began Remedial Design and Remedial Action activities (RD/RA). An ongoing pilot study at OU2 is investigating the effectiveness of horizontal wells for groundwater extraction and treatment. Soil at OU2 is being treated to a depth of 25 feet by soil vapor extraction (SVE).

In FY94, a ROD was signed for OU1. In addition, the installation formed a BRAC cleanup team (BCT) and a restoration advisory board (RAB). The community relations plan, initially approved in FY91, was revised in FY94. The Environmental Baseline Survey was completed in FY93, identifying approximately 2,900 CERFA-clean acres. Federal and state regulatory agencies have concurred with the designations.

In FY95, under a Removal Action, the installation removed a UST from the Airfield Site. Also removed were stained-soil areas, drums, and asbestos-containing material from the Concrete Hardfill Site. Risk assessments were prepared for two sites during FY95, and decision documents for no further action were prepared for five sites at OU5. The installation also completed a Feasibility Study (FS), a Proposed Plan, and a draft ROD for OU3. Under the ROD for OU1, installation of a landfill cap was completed.

The RAB met quarterly in FY96. A ROD was signed for OU3, and the installation adopted an innovative remediation pilot test to evaluate the suitability of intrinsic bioremediation at the site. The test determined that horizontal wells were largely ineffective for use in groundwater extraction and treatment. Treatability Studies (TS) of free-product removal, natural attenuation, bioventing, and SVE were initiated at OU2. After the TS, the ROD was revised to address contamination of the vadose zone as well as soil and groundwater contamination. The installation also completed Remedial Investigation activities at OU4 and OU5.

During FY96, the installation completed an investigation of the extent of petroleum contamination at the Civil Engineering Prime Beef Yard Site. Oil-contaminated soil was removed according to RCRA closure guidelines, and two areas of the site were deemed clean by the regulatory review agencies.

FY97 Restoration Progress

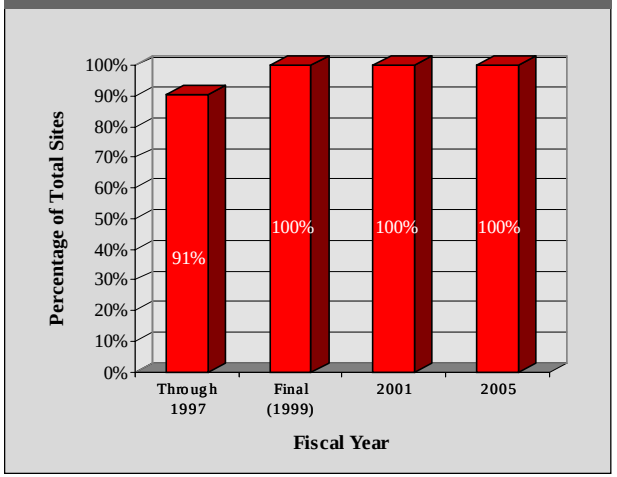
An OU2 TS evaluated natural attenuation and SVE as replacement remedies for pump-and-treat technology and free-product recovery. The TS demonstrated that SVE is more effective for source removal and fuel mass reduction for the soil at ST-12 than is free-product removal by pumping. An OU3 TS addressing vadose zone contamination and an Engineering Evaluation and Cost Analysis also were completed, and RD activities were initiated.

Partnering efforts helped resolve lead cleanup at Site SS-19. The BCT conducted three technical working group meetings in FY97. The latest version of the BRAC Cleanup Plan also was completed in FY97. With regulatory concurrence, 3,796 acres were designated as Category 1 uncontaminated property and are environmentally suitable for transfer. The ROD for OU5 was signed in September 1997.

Plan of Action

- Complete the FS, Proposed Plan, and ROD for OU4 in FY98
- Complete the RA at OU4 sites in FY98
- Continue long-term monitoring and operation and maintenance at the liquid fuel storage areas and the capped landfill No. 4 until FY98

Sites Achieving RIP or RC Per Fiscal Year



Willow Grove Naval Air Station Joint Reserve Base NPL

Size: 1,090 acres
Mission: Serve as Reserve Naval Air Station for aviation training activities
HRS Score: 50.00; placed on NPL in September 1995
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Heavy metals, PCBs, petroleum/oil/lubricants, and solvents
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $4.3 million
Estimated Cost to Completion (Completion Year): $34.1 million (FY2017)
Final Remedy in Place or Response Complete Date: FY2006

Willow Grove, Pennsylvania

Restoration Background

Environmental studies at the installation identified 11 CERCLA sites and two RCRA sites. Site types at the installation include landfills, underground storage tanks (UST), and a fire training area. In an effort to close out sites that pose no risk, decision documents recommending no further action (NFA) at five sites have been submitted for review.

In FY86, Preliminary Assessments (PA) were completed for nine sites. Five sites were recommended for further investigation because of potential contamination of surface water and groundwater. In FY90, all nine sites were included in the Site Inspection (SI), along with a new site (Navy Fuel Farm). An Expanded Site Inspection (ESI) was recommended for Site 7 because of trace levels of methylene chloride. Remedial Investigations and Feasibility Studies (RI/FS) were recommended for Sites 1, 2, 3, and 5. Decision documents recommending NFA for Sites 4, 6, 7, 8, and 9 were submitted to EPA Region 3.

In FY92, two 210,000-gallon USTs were removed from the Navy Fuel Farm (Site 10). Innovative technologies were used in the Remedial Design (RD) for this site. A pilot-scale recovery system for removal of free product was installed in FY93 and continued to operate through FY95.

In FY93, an RI for Sites 1, 2, 3, and 5 recommended a Phase II RI/FS to fill data gaps and identify alternative cleanup actions. In FY95, a Phase II RI work plan was issued for these four sites and for Site 11. Because of funding constraints, however, Site 11 was removed from the work plan.

In FY95, a Removal Action was completed for removal of 6,000 cubic yards of soil at Site 10. A state-approved plan allowed the Navy to remove the soil from this site and spread it on another area at the installation.

The installation formed a technical review committee in FY90. In FY91, it established an administrative record and an information repository. In FY95, the installation established a restoration advisory board (RAB) and developed a community relations plan (CRP). Parties in the community have contacted the installation to express interest in becoming members of the RAB, which is expected to meet quarterly.

In FY96, the first RAB meeting was held. The installation continued to update the CRP while the Phase II RI work plan was made final. The work proposed for four sites was approved. The pilot study of free-product recovery at Site 10 was completed.

FY97 Restoration Progress

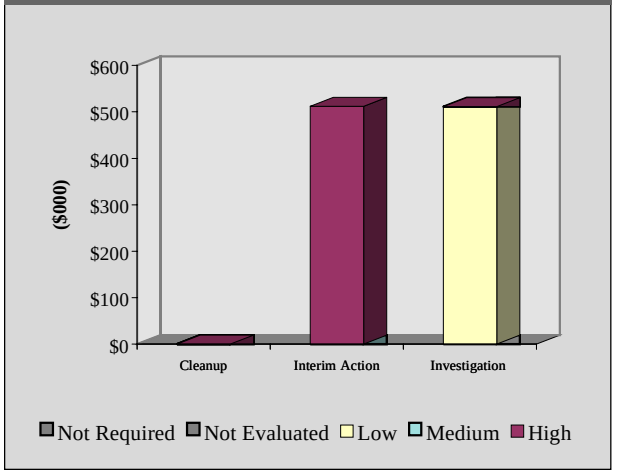
The CRP was completed in conjunction with the Phase II RI work plan. A draft site management plan also was completed. A design-and-build approach was used for Site 10 that allowed the Remedial Action (RA) to be awarded with the RD and completed under one delivery order. Vacuum-enhanced recovery of light nonaqueous-phase liquids with full-time water-table depression and immunoassay kits for polychlorinated biphenyl screening helped accelerate site characterization and fieldwork. Scoping meetings with regulators expedited finalization of the Phase II RI work plan, which allowed an earlier start date for fieldwork and helped resolve issues with regulatory agencies.

Site management plan submissions to EPA, which were originally scheduled for FY97, will occur in FY98. The Phase II RI Report and the FS also have been rescheduled for FY98.

Plan of Action

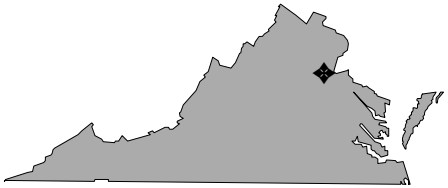
- Complete a final site management plan in FY98
- Complete the Phase II RI/FS for four sites in FY98
- In FY98–FY99, develop a Record of Decision for Site 1 on the basis of the results of the FS and initiate a RD for the preferred alternatives
- Initiate RI/FS activities for Site 11 in FY98
- Initiate RD activities for two sites in FY99 and two sites in FY01
- Implement RAs for all media at all sites between FY99 and the end of FY04

FY98 Funding by Phase and Relative Risk



Woodbridge Army Research Facility

Size: 580 acres
Mission: Conduct electromagnetic testing
HRS Score: NA
IAG Status: None
Contaminants: PCBs, PAHs, pesticides, petroleum hydrocarbons
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $7.9 million
Estimated Cost to Completion (Completion Year): $3.8 million (FY1998)
FInal Remedy in Place or Response Complete Date for BRAC Sites: FY1998



Woodbridge, Virginia

Restoration Background

In July 1991, the BRAC Commission recommended closure of the Woodbridge Research Facility and the relocation of its operations to White Sands, New Mexico; the Adelphi Laboratory Center in Adelphi, Maryland; and Aberdeen Proving Ground, Maryland. Pursuant to Public Law 103-307, the Army will transfer the entire installation to the Department of the Interior (DOI), which plans to include the property as a component in the National Wildlife Refuge System.

Since FY92, site characterization activities have identified 49 areas of concern at the installation. Verified site types include former disposal areas and spill sites. Releases of polychlorinated biphenyls (PCB) and petroleum hydrocarbons from those sites have contaminated groundwater, surface water, sediment, and soil.

In FY94, the installation formed a BRAC cleanup team (BCT) and improved communication among the Army, DOI, and regulatory agencies. The BCT accelerated cleanup efforts by adopting a concurrent document review process.

In FY95, Interim Actions included removal of approximately 1,100 tons of PCB-contaminated soil and approximately 40,000 gallons of PCB-contaminated groundwater and surface water from one site. The installation also completed the design process for removal of one underground storage tank (UST), one oil-water separator, one acid neutralization pit, and two abandoned groundwater production wells. In addition, the commander formed a restoration advisory board.

FY97 Restoration Progress

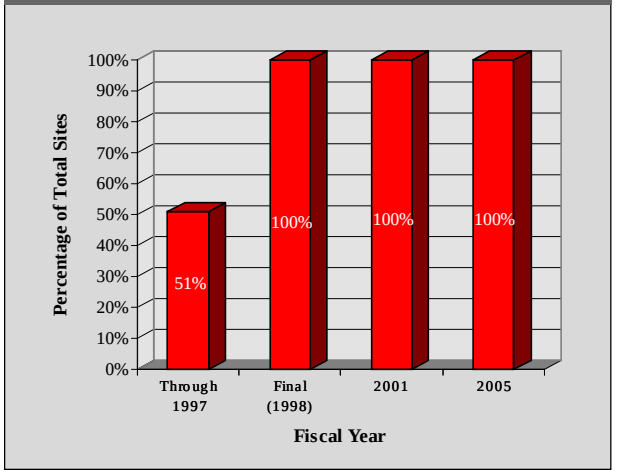
The installation essentially completed the field phase of an installationwide Remedial Investigation and Feasibility Study (RI/FS) begun in FY96. Decision documents for Remedial Actions (RA) at two operable units (OU) were completed in September 1997, along with a decision document calling for no further action (NFA) at 37 installation sites. By the end of FY97, the Army had made RA or NFA decisions on 46 of the 49 sites at the installation.

The installation removed eight USTs, one septic tank, one oil-water separator, one acid neutralization vault, and an array of buried ethylene glycol–filled hoses. In addition, two abandoned water production wells were properly closed.

Plan of Action

- Complete transfer of the installation to DOI in FY98
- Complete RAs at OU1 and OU3 in FY98
- Complete decision-making process at three open sites in FY98
- Complete the installationwide RI/FS in FY98

Sites Achieving RIP or RC Per Fiscal Year



Wright-Patterson Air Force Base NPL

Size: 8,511 acres
Mission: Serve as host to many organizations, including Headquarters to Air Force Material Command
HRS Score: 57.85; placed on NPL in October 1989
IAG Status: IAG signed in March 1991
Contaminants: Waste oil and fuels, acids, plating wastes, and solvents
Media Affected: Groundwater and soil
Funding to Date: $174.9 million
Estimated Cost to Completion (Completion Year): $33.0 million (FY2028)
Final Remedy in Place or Response Complete Date: FY1998

Dayton, Ohio

Restoration Background

Past activities at Wright-Patterson Air Force Base have created spill sites and unlined waste disposal areas, including landfills, fire training areas, underground storage tanks, earth fill disposal areas, and coal storage areas. In FY82, 24 sites were identified at the installation. Subsequent investigation revealed an additional 41 sites. Soil and groundwater at the installation have been contaminated with volatile organic compounds, semivolatile organic compounds, and benzene, toluene, ethyl benzene, and xylene compounds. Past fire training exercises conducted in unlined pits have contaminated soil and groundwater with fuel and its combustion by-products.

In FY89, the installation began Remedial Investigation and Feasibility Study (RI/FS) activities for 39 sites. Early in FY92, the installation completed a Removal Action along the installation boundary to intercept and treat contaminated groundwater flowing toward wellfields in the city of Dayton.

In FY94, the Record of Decision (ROD) for Landfills 8 and 10 was approved and the Remedial Design (RD) was completed to cap the landfills. An Engineering Evaluation and Cost Analysis (EE/CA) and a Removal Action Plan (RAP) for all landfills were approved by regulatory agencies. Approval of the EE/CA and the RAP resulted in adoption of a list of presumptive remedies, expediting the cleanup decision-making process. Also in FY94, an alternative drinking water supply was provided to 12 off-base residences located near landfills on the installation.

In FY95, the installation conducted a pilot-scale study of bioslurping, using vacuum-enhanced extraction. The installation continued to operate the air sparging groundwater treatment system, began construction of the Remedial Action (RA) at Landfills 8 and 10, and performed an Interim Action at Landfill 5 to construct a landfill cap. A restoration advisory board (RAB) was formed and held bimonthly meetings that focused on the application of the Relative Risk Site Evaluation process.

The installation has participated in partnering sessions with EPA and the state regulatory agency to address issues impeding the restoration process, including risk-based funding and the disposal of investigation-derived waste. The installation and regulatory agencies signed a consensus statement to streamline the RI/FS process through the use of generic remedies, establishment of an installationwide groundwater monitoring program, and use of semiquantitative risk assessments.

During FY96, RAB meetings focused on project priorities, funding issues, and the adoption of methods developed at DOE installations and at other DoD installations. In May 1996, a public meeting and presentation session was held to address 21 installation sites that require no further action. Also in FY96, the installation capped three landfills (an Interim Action at Landfill 5 and a final RA at Landfills 8 and 10). A ROD was completed for 21 sites that required no further action. RD was initiated for Landfills 1, 2, 3, 4, 6, and 7, following the basewide Removal Action presumptive remedy process.

FY97 Restoration Progress

RIs were completed at the remaining 10 sites and for Operable Units (OU) 8, 9, and 11. A bioslurper was installed and began operation at Fuel Spill Site 5. Geoprobe technology and an on-site laboratory were used, and a natural attenuation ROD for Fuel Spill Sites 2, 3, and 10 was completed.

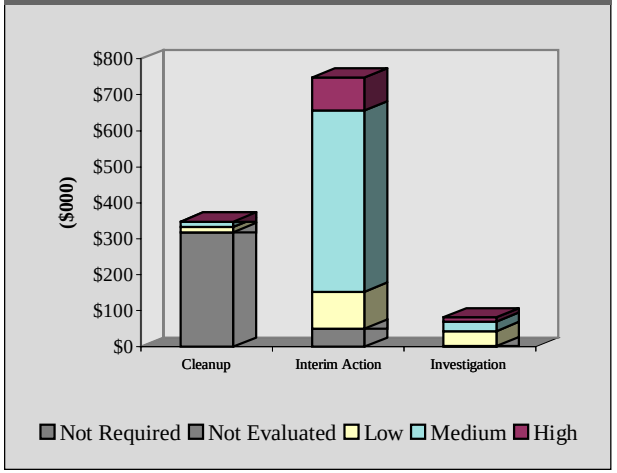
A dedication ceremony was held for the final closure of Landfills 8 and 10, and a press conference took place to highlight the progress made by the Installation Restoration Program (IRP). The installation continued its involvement as a principal partner in the "Groundwater 2000" initiative. This project involves the preservation and protection of the region's sole-source drinking water aquifer.

Preparation of an Action Memorandum for a basewide monitoring program and the final ROD for the entire base were delayed because of delays in preparing the groundwater risk assessment.

Plan of Action

- Prepare an Action Memorandum for groundwater in FY98
- Prepare a final ROD for the entire base in FY98
- Install a landfill cap for Landfills 1, 2, 6, 7, and 9 and a french drain at Spill Site 11 FY98
- Complete excavation of Landfill 12 contents in FY98
- Complete RODs for OUs 8 and 9 and groundwater in FY98
- Design and construct soil Removal Action at Heating Plant 5 in FY98

FY98 Funding by Phase and Relative Risk



Size: 4,626 acres
Mission: Conducted tactical fighter and bomber training
HRS Score: 50.00; proposed for NPL in January 1994
IAG Status: None
Contaminants: Waste fuel and oil, spent solvents, VOCs, paints, heavy metals, and explosives
Media Affected: Groundwater and soil
Funding to Date: $32.3 million
Estimated Cost to Completion (Completion Year): $15.5 million (FY2015)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000

Oscoda, Michigan

Restoration Background

Wurtsmith Air Force Base operated as an aircraft training facility. In July 1991, the BRAC Commission recommended closure of Wurtsmith Air Force Base, transfer of KC-135 aircraft to the Air Reserve Component, retirement of the assigned B-52G aircraft, and inactivation of the 379th Bombardment Wing. The installation closed on June 30, 1993.

Sites identified include a waste solvent underground storage tank (UST), bulk storage areas for petroleum/oil/lubricants (POL), aboveground storage tanks, a landfill, a fire training area, and an aircraft crash site. Volatile organic compounds (VOC) present at the installation include trichloroethene; dichloroethene; vinyl chloride; and benzene, toluene, ethyl benzene, and xylenes, all of which primarily affect groundwater.

Under Interim Actions at the installation, drinking water has been provided to affected communities in the area and air strippers have been installed to treat groundwater contaminated with VOCs. Remedial Actions (RA) include implementation of three groundwater extraction and treatment systems with air stripping capabilities.

The installation's BRAC cleanup team (BCT), which was formed in FY94, developed a master environmental restoration schedule and set priorities for site investigations and actions. A BRAC Cleanup Plan was prepared. Regulatory agencies concurred with the designation of 2,257 acres as CERFA-clean. Intrinsic remediation projects are under way at four fuel-contaminated sites. In FY95, Supplemental Environmental Baseline Surveys were completed to facilitate the transfer of property.

In FY95, the installation conducted Relative Risk Site Evaluations (RRSE) at all sites, involving both the restoration advisory board (RAB) and the BCT in the effort. Draft Feasibility Studies were completed for seven sites, and the installation obtained the concurrence of the regulatory agencies on nine sites designated for no further action. An RA for the removal of eight USTs and most of the piping for the hydrant refueling system also was completed. Additional Interim Actions include removal of the hydrant refueling system and closure of five oil-water separators. The installation also installed groundwater monitoring wells and used groundwater modeling to monitor the natural attenuation of groundwater contaminants.

During FY96, the installation removed 38 USTs and 10 aboveground storage tanks. Three aboveground storage tanks were demolished. Cleanup decisions were made for at least nine sites. Two of the three sewage treatment plant lagoons were closed and the sludge removed. A contract was awarded for installation of a modified pump-and-treat system at Site OT-24. Remedial Design projects for seven sites also were awarded. The installation entered no further remedial action planned decision documents for seven sites and updated RRSEs as new site data were obtained.

Two pilot tests were conducted simultaneously at the former POL storage yard to determine whether free fuel product could be removed from the water table. The bioslurping test failed, but the bioventing test worked properly and is now in use.

FY97 Restoration Progress

In early 1997, the installation's water and sewer systems ceased operating, but physical closure was cancelled at the request of the township of Oscoda so that the plant could be used as a municipal sewage treatment plant in place of the town's current plant. In FY97, an enhanced in situ bioremediation process for groundwater at LF30/31 was agreed to, and the process is under design. The technology will include injection of chemicals to speed up the natural bioremediation process. This will reduce the remediation time significantly over the next 4 years. Furthermore, through the RAB, the installation was able to obtain stakeholder concurrence on the Remedial Action Plan (RAP) for LF30/31. Field investigations at two landfills indicated that no further action is required, and a draft report will be submitted in FY98.

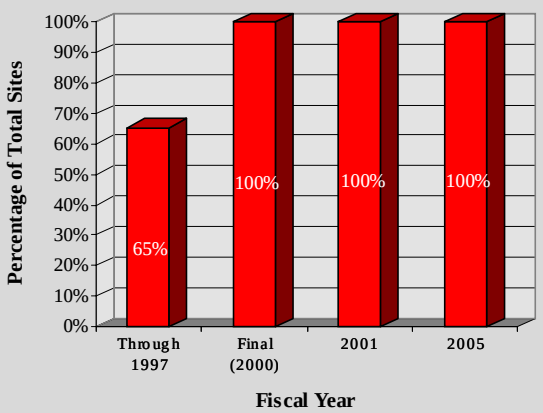
The state of Michigan's expedited review of RAPs has saved time. The BCT also is helping expedite document review by agreeing to the default approval of response to comments if no objection to them is received within 10 days.

The design of the cleanup system RAs experienced some problems, delaying completion of these actions.

Plan of Action

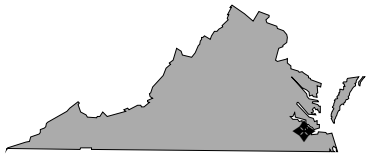
- Complete unfinished investigation projects by mid-FY98
- Complete the cleanup systems for nine sites in FY98
- Submit draft report showing that no further action is required at two landfills in FY98

Sites Achieving RIP or RC Per Fiscal Year



Yorktown Naval Weapons Station NPL

Size: 10, 624 acres
Mission: Provide ordnance technical support and related services; provide maintenance, modifications, production, loading, off-loading, and storage for the Atlantic Fleet
HRS Score: 50.00; placed on NPL in October 1992
IAG Status: Federal Facility Agreement signed in September 1994
Contaminants: Acids, asbestos, explosives, cadmium, lead, mercury, nickel, paint thinners, solvents, PCBs, varnishes, and waste oil
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $22.6 million
Estimated Cost to Completion (Completion Year): $31.2 million (FY2019)
Final Remedy in Place or Response Complete Date: FY2009



Yorktown, Virginia

Restoration Background

Since FY84, environmental studies at Yorktown Naval Weapons Station have identified 50 sites. No further action has been recommended for 13 sites. The installation was placed on the National Priorities List (NPL) primarily because of contamination at six sites identified in FY92. These sites are hydrologically connected to the Chesapeake Bay. Contaminants include explosives and nitramine compounds and primarily affect groundwater, surface water, and sediment.

During FY93, the installation completed an initial site characterization for all four underground storage tank (UST) sites. A corrective action plan (CAP) also was completed. In FY95, corrective actions were completed for USTs 1 and 2.

Between FY84 and FY93, the installation completed an Initial Assessment Study for 19 sites, a confirmation study for 15 sites, and a Site Inspection (SI) for 1 site. During FY94, a Remedial Investigation and Feasibility Study (RI/FS) was completed for one site and Removal Actions were completed for three sites. An SI also was completed for one solid waste management unit (SWMU).

During FY95, an SI was completed for three SWMUs, an RI was completed, and a Record of Decision for no further action was signed for one site and one SWMU. Also in FY95, an innovative process was used to determine whether samples of composite carbon zinc battery waste were hazardous. Test results demonstrated that the waste was not hazardous. This approach saved more than $1 million in disposal costs.

During FY96, the installation completed an SI for eight SWMUs. An RI/FS was completed, and Remedial Design (RD) initiated, for another site. RI/FSs were also initiated at eight sites and five SWMUs.

In addition, a Removal Action was completed for two SWMUs to remove three fire training pits and contaminated soil, a UST and piping, and many underwater ordnance items.

The installation formed a technical review committee in FY91 and converted it to a restoration advisory board (RAB) in FY95. A community relations plan also was completed. A comprehensive site management plan was completed in FY94. The installation also began a joint program with the U.S. Army Corps of Engineers Waterways Experiment Station in Vicksburg, Mississippi. Under this program, the Navy and the Waterways Experiment Station are conducting a Treatability Study of two technologies for treatment of explosives-contaminated soil.

FY97 Restoration Progress

RI/FSs were initiated and completed for four sites. The installation completed field- and bench-scale Treatability Studies for one site and began Remedial Actions for one site. SIs were completed at four SWMUs/Site Screening Areas (SSA). Early actions took place at two SSAs (SSAs 3 and 7). The installation implemented a large-scale pilot study to treat approximately 700 cubic yards of explosives-contaminated soil using an anaerobic bioslurry/biocell technology that employed potato waste as a co-metabolite to enhance degradation.

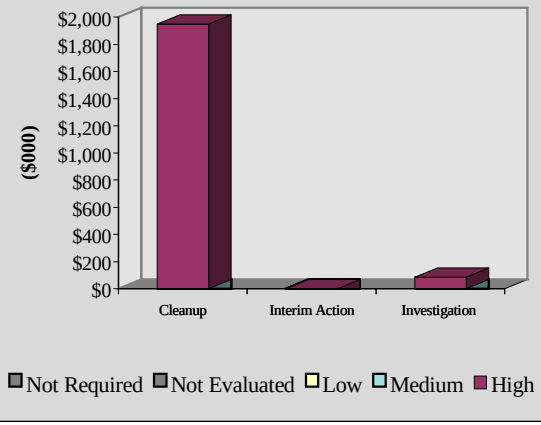
RAB meetings continued to foster a high level of trust within the comminity and a high level of installation commitment to the community. The installation employed partnering efforts to expedite document reviews and to facilitate work with regulatory agencies.

Some RI/FSs, SIs, and RAs that were originally scheduled for FY97 were pushed back to FY98.

Plan of Action

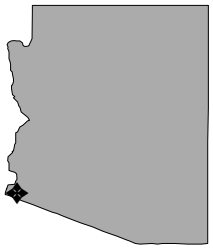
- Complete RI/FSs for two sites in FY98
- Complete SIs at 10 SSAs in FY98
- Begin RAs for three sites in FY98
- Employ anaerobic bioremediation of explosives-contaminated soil at Site 19 in FY98

FY98 Funding by Phase and Relative Risk



Yuma Marine Corps Air Station NPL

Size: 3,000 acres
Mission: Support tactical aircrew combat training for Pacific and Atlantic Fleet Marine Corps Forces
HRS Score: 32.24; placed on NPL in February 1990
IAG Status: Federal Facility Agreement signed in January 1992
Contaminants: JP-5, petroleum hydrocarbons, SVOCs, trihalomethanes, and VOCs
Media Affected: Groundwater and soil
Funding to Date: $31.2 million
Estimated Cost to Completion (Completion Year): $28.4 million (FY2011)
Final Remedy in Place or Response Complete Date: FY2007



Yuma, Arizona

Restoration Background

Investigations conducted between FY85 and FY92 identified 20 CERCLA sites and 5 underground storage tank (UST) sites at Yuma Marine Corps Air Station (MCAS). Site types include landfills, sewage lagoons, liquid waste disposal areas, and ordnance and low-level radioactive material disposal sites.

Under the Federal Facility Agreement, the sites were divided into three operable units (OU) to facilitate cleanup efforts. OU1 addresses installationwide groundwater contamination, OU2 addresses surface and subsurface soil contamination at 18 sites, and OU3 was established for sites that may be identified in the future.

In FY80, the installation completed a Removal Action at one site to remove sealed pipes containing low-level radioactive dials, gauges, and tubes. Site Inspections were completed at two sites in FY88 and at 10 sites in FY91. Under another Removal Action in FY93, the installation removed 92 waste drums from a drum storage site. Initial site characterizations (ISC) were completed at two UST sites in FY93 and at one UST site in FY94. During the FY94 ISC, a pilot Treatability Study was initiated to remove petroleum from the groundwater. The installation constructed three air sparging and soil vapor extraction systems, including one at the fuel farm and one at the motor transportation pool area. During FY95, the installation completed a corrective action plan (CAP) at one UST site and initiated a corrective action at another.

During FY95, the draft Remedial Investigation (RI) Report for OU1 was submitted to regulatory agencies for review. The report identified several areas of contamination that required further investigation. The OU2 RI Report was submitted to regulatory agencies and recommended no further action at 12 sites, industrial controls at 3 sites, and minor surface Removal Actions for asbestos-containing materials at 3 sites.

Field investigations at OU3 were completed during FY96. The installation also completed RIs for OU1 and OU2 and submitted a draft Feasibilty Study (FS) Report for OU2 to the regulatory agencies for review. Also during FY96, the draft Proposed Plan and Record of Decision (ROD) were submitted for OU2. Two pilot studies for in situ cleanup of groundwater were performed for Site 19. Fifty UST site assessments have been performed on UST Units 2, 3, and 4. Approximately 40 of those units are candidates for clean closure, pending approval of the Closure Reports by the state of Arizona.

The installation established a technical review committee and two information repositories in FY90. In FY95, the installation converted the technical review committee to a restoration advisory board (RAB). The community relations plan was completed in FY93 and updated in FY94. Through partnering and an innovative approach, the Yuma MCAS project team, established in FY94, has been able to save 2 to 3 years and approximately $10 million on the RI phase of the cleanup program. The innovative approach consisted of developing expedited, site-specific work plans; using on-site mobile laboratories and cone penetrometer testing and transmitting the resulting data to regulatory agencies; and obtaining concurrence on further sampling without delay.

FY97 Restoration Progress

The installation completed draft CAPs for four USTs and closed six other USTs. A Removal Action and a closeout report were completed for the recently discovered UST B1040. FSs were completed for OU1 and OU2, as was a draft Proposed Plan for OU1. Additionally, the installation implemented geosorbers, a geoprobe, in-well air stripping, and a prepilot ozone sparging study.

To expedite document review, Implementation Memorandum Reports were prepared instead of full work plans, thereby simplifying documents and reducing document size. The installation met with the RAB and presented the Proposed Plan for OU1.

The installation is working with the state to document the ability to file a Voluntary Environmental Mitigation Use Restriction for a land use restriction in the state of Arizona. This process delayed other activities scheduled for FY97.

Plan of Action

- Remove and remediate 12 USTs in FY98
- Complete RODs for OU1 and OU2 in FY98
- Complete Removal Actions at OU2 in FY98
- Complete final CAPs in FY98

FY98 Funding by Phase and Relative Risk